Amendments to the Claims

1. (Original) A method for making polymer-supported metal nanoparticles, comprising:

providing a polymer support material;

contacting the polymer support with an appropriate metal nanoparticle or metal nanoparticle precursor;

contacting the polymer support material and metal or metal precursor with a fluid that swells the polymer support material sufficiently to allow the metal or metal precursor to diffuse into the polymer support material; and

if present, reducing the metal precursor to provide a metal nanoparticle.

2. (Original) The method according to claim 1 where the polymer support material is a plastic.

3. (Original) The method according to claim 1 where the polymer support material is a polyalkylene polymer, a substituted polyalkylene polymer, a halogenated polymer, a polyester, or combinations of such materials.

4. (Original) The method according to claim 1 where the polymer support material is polyethylene, polypropylene, polybutylene, poly(4-methyl-1-pentene), poly(tetrafluoroethylene), perfluoroalkyl-tetrafluoroethylene copolymer, polyimide, polybenzimidazole, and combinations of such materials.

5. (Original) The method according to claim 1 where the plastic support material is high density polyethylene, perfluoroalkyl-tetrafluoroethylene copolymer, or combinations thereof.

6. (Original) The method according to claim 1 where the metal or a metal of the metal precursor is palladium, rhodium, platinum, iridium, osmium, gold, nickel, iron or combinations thereof.

7. (Original) The method according to claim 1 where the metal nanoparticle comprises an alloy or aggregate of two or more different metals.

8. (Original) The method according to claim 1 where the metal precursor includes at least one moiety selected from the group consisting of phosphates, β-diketones, phosphine oxides, dithiocarbamates, crown ethers, and combinations thereof.

9. (Original) The method according to claim 8 where the moiety is selected from the group consisting of tri-*n*-butylphosphate, tri-*n*-octylphosphate, triphenylphosphate, acetylacetone, trifluoroacetylacetone, hexafluoroacetylacetone, thenoyltrifluoroacetone, heptafluorobutanoylpivaroylmethane, 4, 4-trifluoro-1-(2-thienyl)-1, 3-butanedione, tri-*n*-butylphosphine oxide, tri-*n*-octylphosphine oxide, triphenylphosphine oxide, bis(trifluoroehtyl)dithiocarbamate, diethyldithiocarbamate, H-crown, F2-crown, F6-crown, and combinations thereof.

10. (Original) The method according to claim 6 where the metal precursor comprises Pd(II).

11. (Original) The method according to claim 10 where the metal precursor comprises $Pd(hfa)_2$.

12. (Original) The method according to claim 6 where the metal precursor comprises Rh(III).

13. (Original) The method according to claim 12 where the metal precursor comprises $Rh(acac)_3$.

14. (Original) The method according to claim 1 further comprising contacting the support material in a pressure cell.

15. (Original) The method according to claim 1 where the fluid is carbon dioxide, nitrogen, nitrous oxide, methane, ethylene, propane or propylene.

16. (Original) The method according to claim 1 where the fluid is supercritical.

17. (Original) The method according to claim 1 where the fluid is supercritical carbon dioxide.

18. (Original) The method according to claim 1 where reducing a metal of the metal nanoparticle precursor comprises contacting the metal precursor with hydrogen.

19. (Original) The method according to claim 16 comprising hydrogen reduction at a pressure greater than ambient.

20. (Original) The method according to claim 16 where the hydrogen reduction is conducted at a pressure greater than ambient to a pressure of at least 300 atmospheres.

Claims 21–84 (Canceled)